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ABSTRACT

This paper discusses the "Teaching Math and Science: Reaching for Excellence" video which was developed to challenge the claims that math and science are difficult, tedious, and boring and asks students to consider math and science as career options. The video offers an honest approach to the state of teaching mathematics and science through the voices of students, teachers, professors, and administrators. The purpose of the project is to develop an effective tool to use with individuals and groups in workshops, seminars, orientations, outreach, and counseling sessions that address careers and to determine if, after using such a tool, students and professionals emerge with a new attitude towards teaching science and mathematics. (KHR)

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VIDEO AS A TOOL TO CHANGE ATTITUDES ON TEACHING SCIENCE AND MATHEMATICS

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Produced for students and counselors, the video "Teaching Math and Science: Reaching for Excellence" challenges the claims that math and science are difficult, tedious and boring, and asks students to take a fresh look and consider math and science as a career option. The video offers an honest approach to the state of teaching mathematics and science through voices of students, teachers, professors and administrators. It is used in workshops, seminars, orientation sessions, and counseling sessions dealing with careers. Students as well as professionals who have seen the video have found new inspiration and new perspectives on the importance of math and science in our society and the pivotal role of teachers.

Introduction

Improving science and math teaching is critical to our society and to the U.S. economy because students in the United States have been shown to perform below international averages in these subjects [1,2]. Equally important is increasing the diversity of teachers to work with students of different backgrounds [3]. How do we get there? How do we break down the current stereotypes of science and math teachers? How can we get all students to take a new look at the world around them and become captivated with the wonder of science and the fascination of mathematics? How can we let students and counselors know that teaching science and mathematics is a rewarding, interesting, affordable, and doable career option? The search for an answer to these questions originated this project.

PURPOSE

The purpose of this project was (1) to develop an effective tool to use with individuals and groups in workshops, seminars, orientations, outreach, and counseling sessions dealing with careers and (2) to determine if after using such a tool students and professionals would emerge with a new positive attitude towards teaching science and mathematics.

Procedure

The idea for the project started with the Long Beach Elementary Science/Mathematics Teacher Education Partnership (LBESTEP) funded by the National Science Foundation. Under

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the partnership, the College of Natural Sciences and Mathematics and the College of Education at California State University, Long Beach (CSULB) teamed with Advanced Media Production to produce a video. The goal was to change neutral or negative attitudes on teaching math and science to positive and encouraging outlooks, while offering an honest representation of the field.

DESIGN OF INTERVENTION

A "Concept Development Form" (Fig.1) from Advanced Media Production framed the project design. Following is our project's information according to the form.

Concept Development Form

This form serves to identify goals, concepts, and potential audiences.

Subject/Title _____

Primary audience to be reached (age, interest, education, occupation, etc.)

_____

_____

Secondary audience:

_____

_____

What is the audience expected to believe after viewing?

_____

_____

What is the audience expected to do after viewing?

_____

_____

List 5 major and 5 minor concepts that are part of the production's message.

1. _____	**1.** _____
2. _____	**2.** _____
3. _____	**3.** _____
4. _____	**4.** _____
5. _____	**5.** _____

Other considerations: a. Audience's present attitude toward the subject; b. Benefit granted by the production; c. Other productions available on the same subject; d. Approach; e. Marketing/distribution; f. Funds; g. Additional materials required for use; h. Special production requirements; i. Completion date; j. Content expert/approval; k. Release forms.

Fig. 1. Sample Concept Development Form.

The "primary audience to be reached" includes students in grades 10-16, high school and college counselors, student services professionals, career counselors and advisors. The "secondary audience" is any other group that would benefit from viewing the production, and in this case includes parents of high school students, members of educational partnerships, education agencies, national associations, development officers in education, legislators, and National Science Foundation and NASA Program Officers.

After viewing the production, the audience is expected to have new or modified beliefs about teaching science and mathematics, specifically that (1) teaching math and science is a rewarding, interesting, and doable career option and (2) this career is affordable, has easy entry, and provides a good income and satisfying life. Students are expected to visualize enjoying teaching science and mathematics.

This production is intended to encourage students to ask their counselors and advisors about different career paths to teaching mathematics and science. Additionally, counselors and parents are expected to advise students to consider math and science as a career option.

There are five essential points for the video to communicate to the audience:

1. Teaching science and mathematics is rewarding as a career choice,
2. A career in math and science is doable and affordable,
3. Improving teaching of science and mathematics is critical to the U.S. economy and society,
4. There is a need to increase teacher diversity, and
5. Science and mathematics are intrinsically interesting, fun, and fascinating!

Four minor concepts were also identified for inclusion in the program. They are:

1. Counselors are key players in inspiring students to choose math and science as a career,
2. Students need information on the preparation needed to become a teacher,
3. New jobs increasingly require skills in math and science, and
4. U.S. students rank low in math and science proficiency.

Other considerations in the project were the audience's possible lack of knowledge on the subject and their neutral-to-negative attitude toward teaching math and science. The video is intended as a recruitment tool and also to promote the College of Natural Sciences and Mathematics and the College of Education as well as the National Science Foundation. At the time of our proposal, we found no other such tool for recruitment. We wanted a short piece (around 10 minutes) with absolute honesty about the subject that would provide genuine connections to persons in the field.

Another very important factor to be considered was the marketing of the program. The video was intended to stand alone or to be used by a speaker along with informational materials, recruitment cards and brochures produced by the Colleges of Natural Sciences and Mathematics

and Education. After distributing an initial set of free copies, it was planned that a nominal cost would be charged.

Production requirements included shooting at various locations, some outdoors. Interviews were conducted at the CSULB campus and at the U.S. Geological Survey Office in Pasadena, California. The content of the video was approved by the LBESTEP Steering Committee and the Colleges of Natural Sciences and Mathematics and Education.

PRODUCTION

The filming schedule spanned summer and fall 2000. It included summer math and science camps for elementary students at the CSULB campus, two Long Beach Unified School District school sites (Emerson Academy and Millikan High School), two community colleges (Long Beach City College, and Cerritos College in Norwalk, California) and interviews at CSULB and the office of the U.S. Geological Survey.

In January, 2001, we reviewed nine reels of film from Advanced Media Production. For each reel, a list was prepared of "Site/Scene Description" and accompanying "Window Burn" numbers. Each member of the working team was given a copy of the list to identify scenes to be included and to give reasons for each selection. The list with the selected film clips and comments was passed on to the Advanced Media Production director who assembled the selections and drafted a script. The authors and members of the LBESTEP Steering Committee edited and fine-tuned the content and script, and Advanced Media Production added graphics and additional sound and visual effects.

IMPLEMENTATION

The video was shown for the first time to the Visiting Committee from the National Science Foundation in early 2001. In March 2001 it was used in a workshop called "Exploring Teaching" for 44 students in 11th and 12th grade, and in June 2001 in a session of the "California K-16 Partnerships and Student Success Conference" in Long Beach, California. Since then, the video has been in regular use in the College of Natural Sciences and Mathematics and the College of Education at CSULB. It has been shown at college-wide meetings, used in student orientations at CSULB and with community college counselors, university advisors, and in training sessions with undergraduate students in Liberal Studies. Approximately 80 copies of the video have been distributed to various institutions in California and other states, with a return postcard for evaluation and/or feedback.

The video is now shown every semester at training sessions for students entering the SERVE (Service Experiences for ReVitalizing Education) Program in the College of Education at CSULB, which places students in service-learning positions as tutors to students at risk in public schools. The SERVE Program is partially funded by LBESTEP. In addition, the video is being digitized and will appear on the websites of the College of Natural Sciences and Mathematics and of the SERVE Program in spring 2002.

EVALUATION

An evaluation questionnaire is included with every video that is sent out, and at every workshop in which the video is used. A pre- and post- viewing survey was created for sessions

with high school students to capture a change of attitude/perspective on teaching math and science.

Results

The purpose of this project was (1) to create a tool to use with individuals and with groups that would give an honest depiction of teaching math and science and (2) to determine if students and professionals would have a new positive attitude towards teaching science and mathematics.

Evaluations were conducted to give an indication of how the video was viewed and how it was received and understood. While not a formal study, the evaluations provided a measure of the effectiveness and value to the viewer and to all those with an interest in promoting excellence in math and science.

STUDENTS

Many students who viewed the video began to see math and science in a different way, personally and from a teaching perspective. Some representative quotes are:

> "I realized both math and science play an important role in our society dealing with technology. I now realize that math and science can be fun if appropriate techniques are applied."
>
> "I think it won't be that boring after all."
>
> "After watching this video, I think different(ly) about math and science. It would be great to make a difference in a child's life and teach them something new. Make teaching fun."
>
> "If I become a teacher, I would most likely become a math teacher."
>
> "I would now consider teaching science."

PROFESSIONALS

After viewing the video, professionals also found that a new outlook makes a difference in their work related to science and mathematics. Here are a few of their responses:

> "Attitude and perspective is EVERYTHING!"
>
> "It rekindled the idea to pass along the enjoyment of discovery … no matter what age."
>
> "Good teaching results in success in math and science."

In every case that we had the opportunity to interact with professionals and offer them the video, they eagerly accepted a copy. We did not receive any response postcards that we included

with the video. With the video becoming available on-line, the need to charge for copies no longer exists.

Discussion

It was important to the success of this project to be completely honest in the message conveyed, and the production team would have it no other way. Students deserve the truth and accurate information in order to make a decision on a career path. Seeking that information from different individuals who arrived at science and mathematics from different paths was our way of presenting a genuine picture to our audience.

The learning that took place through this project was at many different levels, from the intended changes of attitude of the viewers to the unexpected results of relationships formed and partnerships strengthened. The video production became an excellent professional development tool, a worthwhile endeavor where every participant had an equally important contribution to make, and where learning from each other became vibrant. Professionals felt important and vulnerable at the same time; they waited their turn for interviews alongside students, opened their classrooms and their souls to the camera, and proudly introduced their students to us. Students and professionals alike were often surprised as they reflected out loud on a dream, on the memory of a teacher, on the difference that one person made in a beautiful area of their learning. Throughout, we were highlighting and exploring a delight in teaching science and mathematics, and for touching lives. Emotions were high in filming areas that traditionally are not associated with emotion. Emotions were important in reaching those who will teach the next generation. The next generation is ready.

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Every participant's candor, enthusiasm and generosity made this project possible: we extend our gratitude, admiration and respect.

Bios

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Dave Kelly is the Director of Advanced Media Production at California State University, Long Beach. Mr. Kelly supervises the work of a talented staff in producing educational television programming for national satellite broadcasting, cable TV distribution, and Internet Web casting. Mr. Kelly is also a television documentary writer and producer. A program he wrote and directed about the Pacific Rim trading sphere, titled "Cargoes and Cultures," appeared on PBS stations nationwide in 1996. He also worked for three years as a television news reporter for a CBS affiliate in the Midwest. During that time, he won a national award from the Society of Professional Journalists for Presidential Campaign coverage in the state of Iowa. His Hollywood credentials include a stint as a free-lance screenplay analyst for the David Geffen Film Company in 1984. Mr. Kelly earned a Master's degree in Cinema/TV Production from the University of Southern California and a Bachelor's degree from Drake University in Broadcast Journalism.

Hilda Sramek is the Director of the SERVE (Service Experiences for ReVitalizing Education) Program at California State University, Long Beach. Ms. Sramek has a Master of Science degree in Microbiology and a Master of Science degree in Counseling: Student Development in Higher Education, both from California State University, Long Beach, and an Instructor Credential in Biological Sciences for the California Community Colleges.

References

[1] TIMSS. The Third International Mathematics and Science Study, 1995. Available: http://timss.bc.edu/TIMSS1/about_main.htm.

[2] Viadero, D. "U.S. seniors near bottom in world math, science tests." *Education Week*, March 4, 1998.

[3] California Commission on Teacher Credentialing, 2001. Available: http://www.ctc.ca.gov

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